

## REMARKS

In the Office Action mailed December 13, 2007, the Examiner withdrew the indicated allowability of claims 4, 10, and 17 and rejected claims 1-3 and 5-21 under 35 U.S.C. § 103(a). The Examiner also indicated that the replacement drawings submitted on October 14, 2007 were acceptable, and Applicants thank the Examiner for indicating as such. Applicants have now amended claims 1, 8, and 15 and added new claim 22. Applicants submit that claims 1-22 as written are in condition for allowance and respectfully request notice to this effect.

### 1. Response to § 103(a) Rejections of Claims 1-3 and 5-21

The Examiner rejected (a) claims 1-3, 5, and 7 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,786,725 (*Boccuzzi*) in view of U.S. Publication No. 2004/0190655 (*Chung*) and Applicants' admitted prior art of the current application (AAPA), (b) claim 6 under 35 U.S.C. § 103(a) as being obvious over *Boccuzzi* in view of *Chung*, AAPA, and U.S. Patent No. 6,674,822 (*Legrand*), (c) claims 1-3, 5, 7-12, 14-16, and 18-19 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,055,281 (*Hendrickson*) in view of *Chung* and AAPA, and (d) claim 6 under 35 U.S.C. § 103(a) as being obvious over *Hendrickson* in view of *Chung*, AAPA, and *Legrand*.

In the previous Office Action, the Examiner indicated that claims 4, 10, and 17 included allowable subject matter. See Office Action mailed June 24, 2007, p. 12. Each of these claims recited that a frequency offset is determined by comparing the in-phase (I) and quadrature (Q) components of an input signal with a second delayed, conjugated version of the I and Q components of the input signal, where the delay is *approximately one sample interval*. In response, Applicants amended independent claims 1, 8, and 15 to incorporate the allowable subject matter. See Applicants' Response to Office Action mailed June 24, 2007. In the present Office Action, however,

the Examiner withdrew the previous indication of allowability “based on a broader interpretation of the claimed limitation ‘sample interval’ (which in the claim is not specified as being less than a symbol interval).” See Office Action mailed December 13, 2007, p. 2. As a result of this broader interpretation, the Examiner found that *Chung* discloses a frequency offset calculation circuit to determine a frequency offset by comparing the I and Q components of the input signal with a second delayed, conjugated version of the I and Q components of the input signal, where the delay is approximately one sample interval. See, e.g., Office Action mailed December 13, 2007, p. 4.<sup>1</sup>

In light of the Examiner's basis for withdrawal, Applicants have now amended claims 1, 8, and 15 to clarify that the delay associated with the second delayed, conjugated version of the in-phase and quadrature components of the input signal is *less than one symbol interval*. This amendment is supported by the Applicants' Specification. See, e.g., Applicants' Specification, ¶ 0035 (“The delay circuit [of the frequency offset calculator] delays the I and Q components for the duration of a sample. That is, the delay is  $T_{\text{sym}}/N$ , where N is preferably [the] number of samples per symbol.”). Further, this amendment clarifies the differences between the recited frequency offset determination and the phase extraction circuit in *Chung*, which delays the input signal by a full sample interval. See, e.g., *Chung*, P0005 (“the delay circuit 41 is used to store the **last input symbol  $Z_{k-1}$** ”; “[t]he conjugate circuit 42 generates a conjugate  $Z_{k-1}^*$  of the **last input symbol  $Z_{k-1}$**  and the multiplier derives a product of the input symbol  $Z_k$  and the conjugate  $Z_{k-1}^*$  of the **last input symbol  $Z_{k-1}$** ”) (emphasis added). Neither *Chung*, nor any other reference cited by the Examiner, shows or suggests a system or method for determining frequency offset by delaying the I and Q components of an input signal by *less than one symbol interval* (e.g., a sample interval).

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<sup>1</sup> The Examiner did not assert that any other cited references taught the recited frequency offset determination.

Because the combination of references cited by the Examiner does not show or suggest all of the elements recited in claims 1, 8, and 15, Applicants submit that claims 1, 8, and 15 are not obvious in light of the combination of any references cited by the Examiner. Further, because claims 2-3, 5-7, 9-14, and 16-21 depend from claims 1, 8, and 15, Applicants submit that claims 2-3, 5-7, 9-14, and 16-21 are not obvious in light of the combination of any references cited by the Examiner for at least the reasons described with reference to claims 1, 8, 15.

**2. Response to § 103(a) Rejections of Claims 1-3 and 5-21**

Applicants have also added new claim 22, which depends from claim 1 and is substantially similar to canceled claim 4. As previously described, the combination of references cited by the Examiner does not show or suggest all of the elements recited in claim 1. As such, because claim 22 depends from claim 1, Applicants submit that new claim 22 is not obvious in light of the combination of any references cited by the Examiner for at least the reasons described with reference to claim 1.

## CONCLUSION

In light of the above amendments and remarks, Applicants submit that the present application is in condition for allowance and respectfully request notice to this effect. The Examiner is requested to contact Applicants' representative below if any questions arise or he may be of assistance to the Examiner.

Respectfully submitted,

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